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itself multiplied by the distance of the luminous point from the aperture added to the distance of the aperture from the screen, and divided by the distance of the luminous point from the aperture. Hence it is obvious that the size increases more slowly than the distance of the screen from the aperture, and in the case of a distant object, like the sun, almost imperceptibly. When neither the aperture nor the luminous object is a physical point, each strives to imprint its own figure upon the screen, and the resulting shape will resemble that of the aperture or the object according to the size of the two images which each would separately impress, as calculated above. If the size of the aperture is to the size of the luminous object as the distance between the aperture and screen is to the distance between the luminous body and the screen, the separate images which the aperture and the luminous body will form are of the same size, and therefore their shape is equally influential in forming the resulting figure. When the distance of the screen is thirty feet from the aperture, the two images above described are of the same size with solar light if the aperture is between three and four inches. Now when the distance between the screen and the aperture is changed, the size of the image which belongs to the luminous body changes much more than that which belongs to the aperture. Consequently, if the screen on which the images are painted is much farther than thirty feet, the size of the aperture being three or four inches, or if the size of the aperture is diminished, the distance between the screen and the aperture remaining the same, the influence of the sun's form will prevail, and in extreme cases the resulting figure will represent the shape of the sun to the exclusion of all trace of the shape of the aperture. Hence with very small apertures the final image will have no resemblance in shape to the aperture, except when received very near to the aperture. But with nearer bodies, as the flame of a candle, the shape of the aperture continues upon the screen at larger distances, or with the same distance when smaller apertures are employed."

Four hundred and fourth meeting.

September 12, 1854. — MONTHLY MEETING.

The PRESIDENT in the chair.

The Corresponding Secretary read letters from Sir William Hamilton, accepting his appointment of Foreign Honorary

Member; and from Dr. Walter Channing, resigning the Fellowship of the Academy.

Dr. Hayes presented a pamphlet, "Reminiscences of Glass-Making," by Deming Jarves, accompanying the donation by some remarks on that art. He stated that at the present time the United States are before all other countries in the manufacture of flint glass, both in the quality and quantity of the article produced.

Dr. Hayes also presented the report of the committee of the Franklin Institute, with one of his own appended, on E. G. Pomeroy's new process of coating iron with copper, and exhibited iron spikes coated by the process described.

Professor Lovering exhibited to the Academy Plateau's new instrument, the *Anorthoscope*, and explained its construction and use.

Professor J. Wyman said, that since the previous meeting, in consequence of the remarks then made on the form of the image produced by the sunlight in passing through apertures of various shapes and sizes, he had examined the pupil of the eye in various animals with reference to the point in question. Professor Wyman described this as it exists, of various shapes; but he found by experimenting with apertures of similar shapes cut in cards, that the image of the sun transmitted through them remained always the same, with the exception of a greater or less penumbra at the circumference.

Dr. C. T. Jackson gave an account of the recent discovery of gold at Bridgewater, Vt., where it is found in a vein of quartz a foot and a half thick, in company with sulphuret of lead, silver and copper pyrites. One ton of reduced lead from this locality yields over six hundred dollars' worth of gold.